



— BUREAU OF —
RECLAMATION

Colorado River Basin Hydrology Update

LCR MSCP Steering Committee Meeting
October 27, 2021

Colorado River Drought



Lake Powell near Glen Canyon Dam



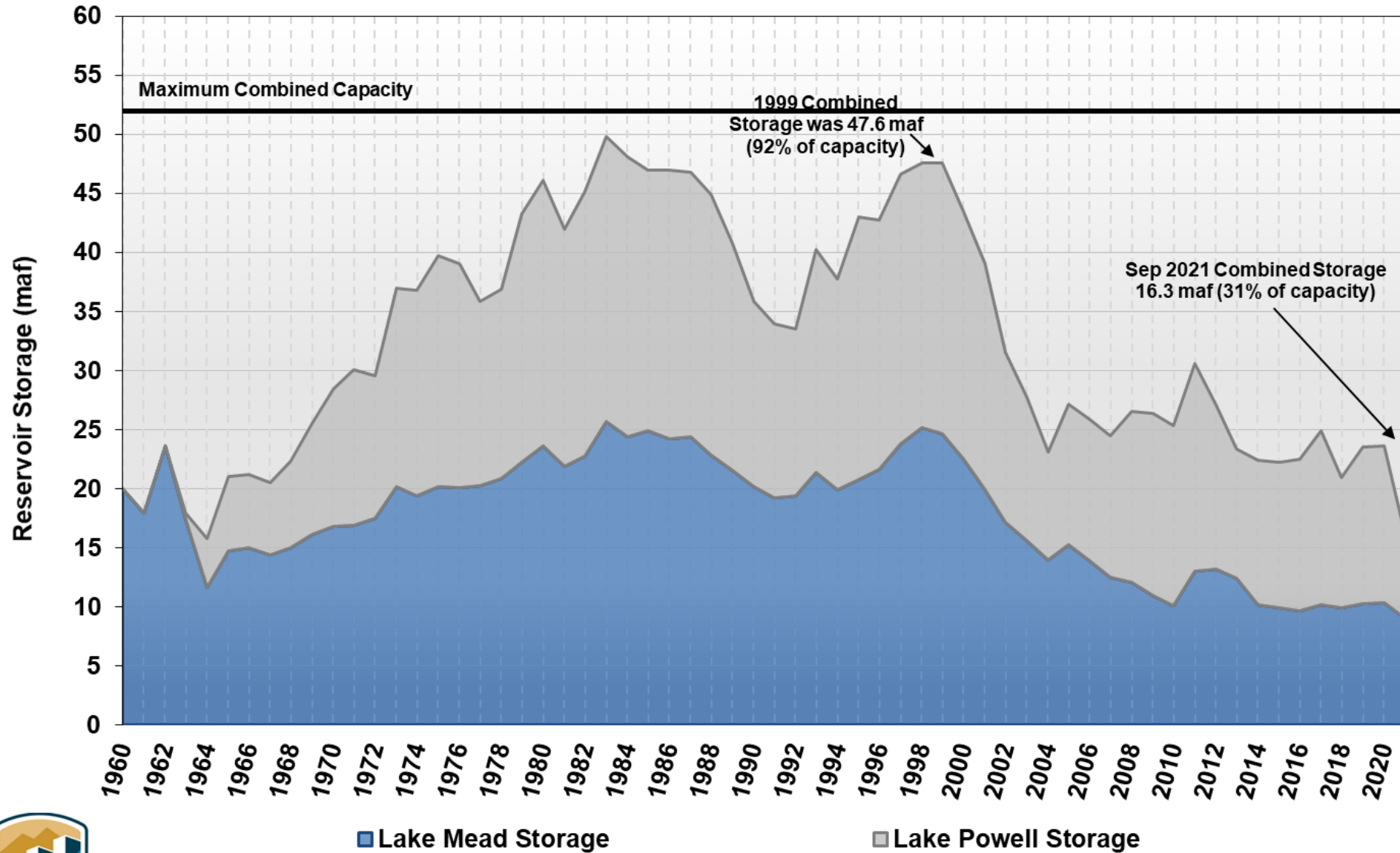
Lake Mead near Hoover Dam

- Driest 22-year period (2000–2021) on record
- Water Year 2021 was second lowest inflow into Lake Powell since 1964
- Lake Powell – historical low level reached on July 24
 - Current elevation is 3,544 feet, or 30% of capacity
- Lake Mead – historical low level reached on June 9
 - Current elevation is 1,067 feet, or 34% of capacity



Lake Powell and Lake Mead End of Water Year Storage

Water Years 1960 through 2021



Lake Powell & Lake Mead Operational Table

Operating Determinations for Water Year/Calendar Year 2022

Lake Powell			Lake Mead		
Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf) ¹	Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf) ¹
3,700	Equalization Tier Equalize, avoid spills or release 8.23 maf	24.3	1,220	Flood Control Surplus or Quantified Surplus Condition Deliver > 7.5 maf	25.9
3,636 - 3,666 (2008-2026)	Upper Elevation Balancing Tier ³ Release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	15.5 - 19.3 (2008-2026)	1,200 (approx.) ²	Domestic Surplus or ICS Surplus Condition Deliver > 7.5 maf	22.9 (approx.) ²
3,575			1,145	Normal or ICS Surplus Condition Deliver ≥ 7.5 maf	15.9
			1,105		11.9
			1,075		9.4
	Mid-Elevation Release Tier Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	9.5		1,065.85 ft	
	3,535.40 ft			Shortage Condition Deliver 7.167 ⁴ maf	
3,525	Jan 1, 2022 Projection	5.9	1,050	Shortage Condition Deliver 7.083 ⁵ maf	7.5
3,490	Lower Elevation Balancing Tier Balance contents with a min/max release of 7.0 and 9.5 maf	4.0	1,025		5.8
3,370		0	1,000	Shortage Condition Deliver 7.0 ⁶ maf Further measures may be undertaken ⁷	4.3
			895		0

Diagram not to scale

¹ Acronym for million acre-feet

² This elevation is shown as approximate as it is determined each year by considering several factors including Lake Powell and Lake Mead storage, projected Upper Basin and Lower Basin demands, and an assumed inflow.

³ Subject to April adjustments which may result in a release according to the Equalization Tier

⁴ Of which 2.48 maf is apportioned to Arizona, 4.4 maf to California, and 0.287 maf to Nevada

⁵ Of which 2.40 maf is apportioned to Arizona, 4.4 maf to California, and 0.283 maf to Nevada

⁶ Of which 2.32 maf is apportioned to Arizona, 4.4 maf to California, and 0.280 maf to Nevada

⁷ Whenever Lake Mead is below elevation 1,025 feet, the Secretary shall consider whether hydrologic conditions together with anticipated deliveries to the Lower Division States and Mexico is likely to cause the elevation at Lake Mead to fall below 1,000 feet. Such consideration, in consultation with the Basin States, may result in the undertaking of further measures, consistent with applicable Federal law.

¹ Lake Powell and Lake Mead operating determinations are based on August 2021 24-Month Study projections consistent with the 2007 Interim Guidelines and 2019 Drought Contingency Plans. These determinations will be documented in the 2022 Annual Operating Plan for Colorado River Reservoirs.



Shortage Reductions and Water Savings Contributions
Under the 2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan (DCP)*,
and Binational Water Scarcity Contingency Plan
(Volumes in thousand acre-feet)

Lake Mead Elevations (in feet)	2007 Interim Guidelines Shortage Reductions (U.S.)		Minute 323 Delivery Reductions (Mexico)	Total Combined Shortage Reductions (U.S. and Mexico)	DCP Water Savings Contributions (U.S.)			Binational Water Scarcity Contingency Plan Water Savings (Mexico)	Combined Volumes of Shortage Reductions and Water Savings Contributions by Lower Basin State and by Country (U.S. and Mexico)					Total Combined Volumes (U.S. and Mexico)
	AZ	NV	Mexico	Lower Basin States + Mexico	AZ	NV	CA	Mexico	AZ Total	NV Total	CA Total	Lower Basin States Total	Mexico Total	Lower Basin States + Mexico
1,090 - >1,075	0	0	0	0	192	8	0	41	192	8	0	200	41	241
1,075 - >1,050	320	13	50	383	192	8	0	30	512	21	0	533	80	613
1,050 - >1,045	400	17	70	487	192	8	0	34	592	25	0	617	104	721
1,045 - >1,040	400	17	70	487	240	10	200	76	640	27	200	867	146	1,013
1,040 - >1,035	400	17	70	487	240	10	250	84	640	27	250	917	154	1,071
1,035 - >1,030	400	17	70	487	240	10	300	92	640	27	300	967	162	1,129
1,030 - 1,025	400	17	70	487	240	10	350	101	640	27	350	1,017	171	1,188
<1,025	480	20	125	625	240	10	350	150	720	30	350	1,100	275	1,375

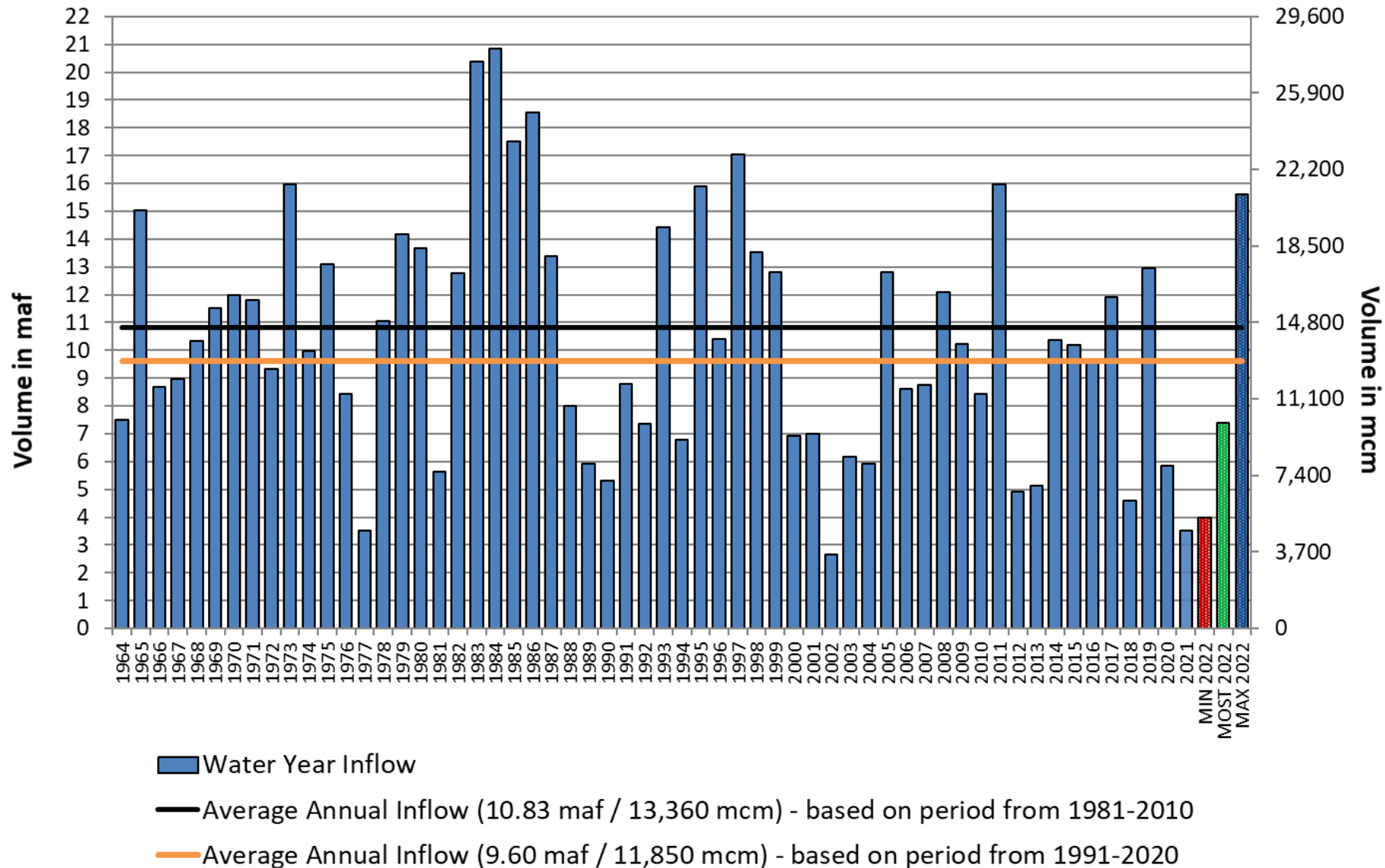
*Under the Lower Basin DCP, the United States will take affirmative actions to create or conserve 100,000 acre-feet or more of Colorado River system water on an annual basis to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the Lower Basin. All actions taken by the United States shall be subject to applicable federal law, including availability of appropriations.



**Lake Mead
2022 Operating
Condition**

Lake Powell Unregulated Inflow

Water Years 1964 through 2022



Unregulated Inflow for Water Year 2021

Observed:

- 3.50 maf
- 32% of average*

*Percent of average based on period of from 1981-2010

Unregulated Inflow Forecasts for Water Year 2022 as of October 4, 2021

Min Probable (10th-percentile):

- 4.00 maf
- 42% of average**

Most Probable (median):

- 7.40 maf
- 77% of average**

Max Probable (90th-percentile):

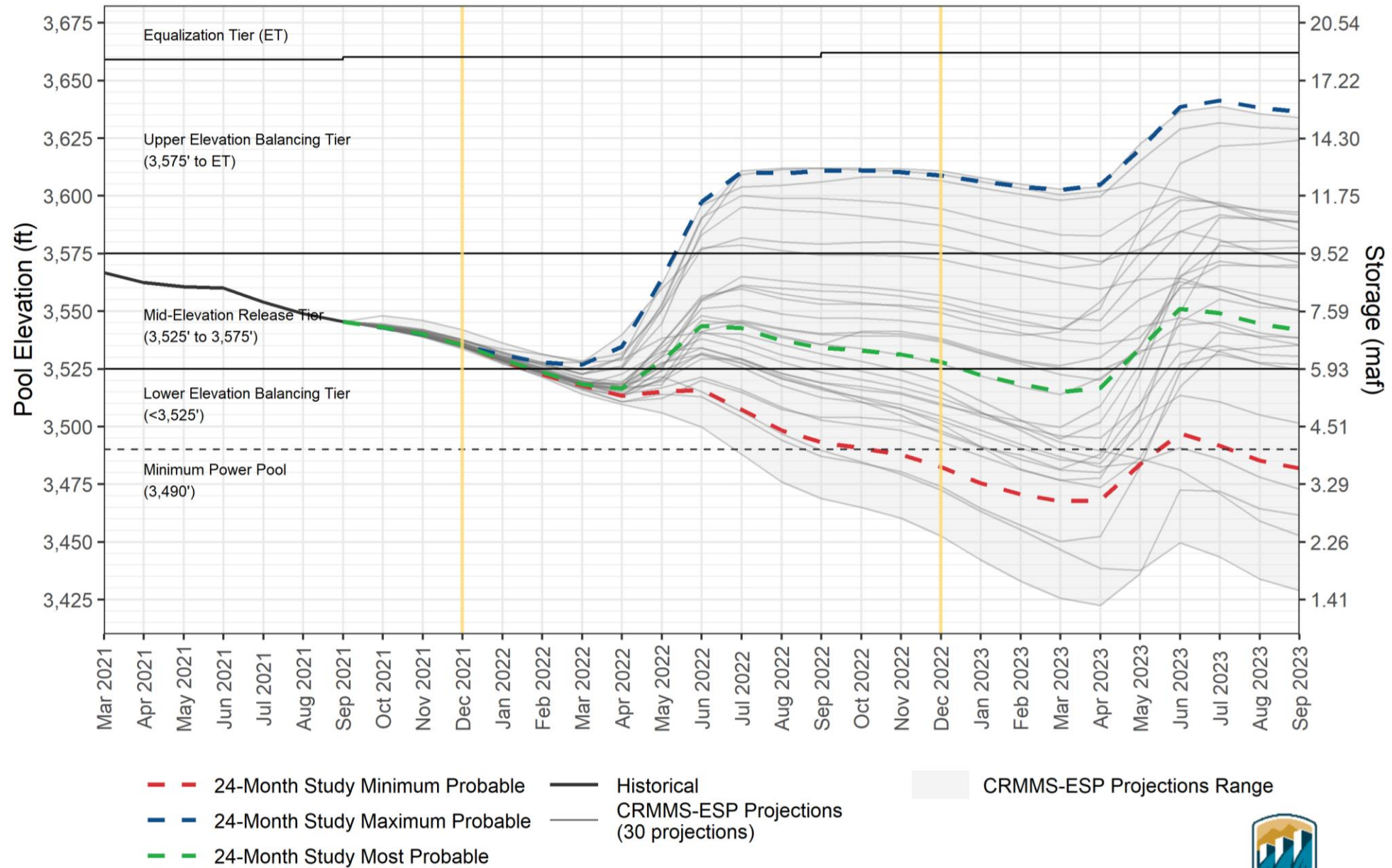
- 15.60 maf
- 162% of average**

**Percent of average based on period from 1991-2020



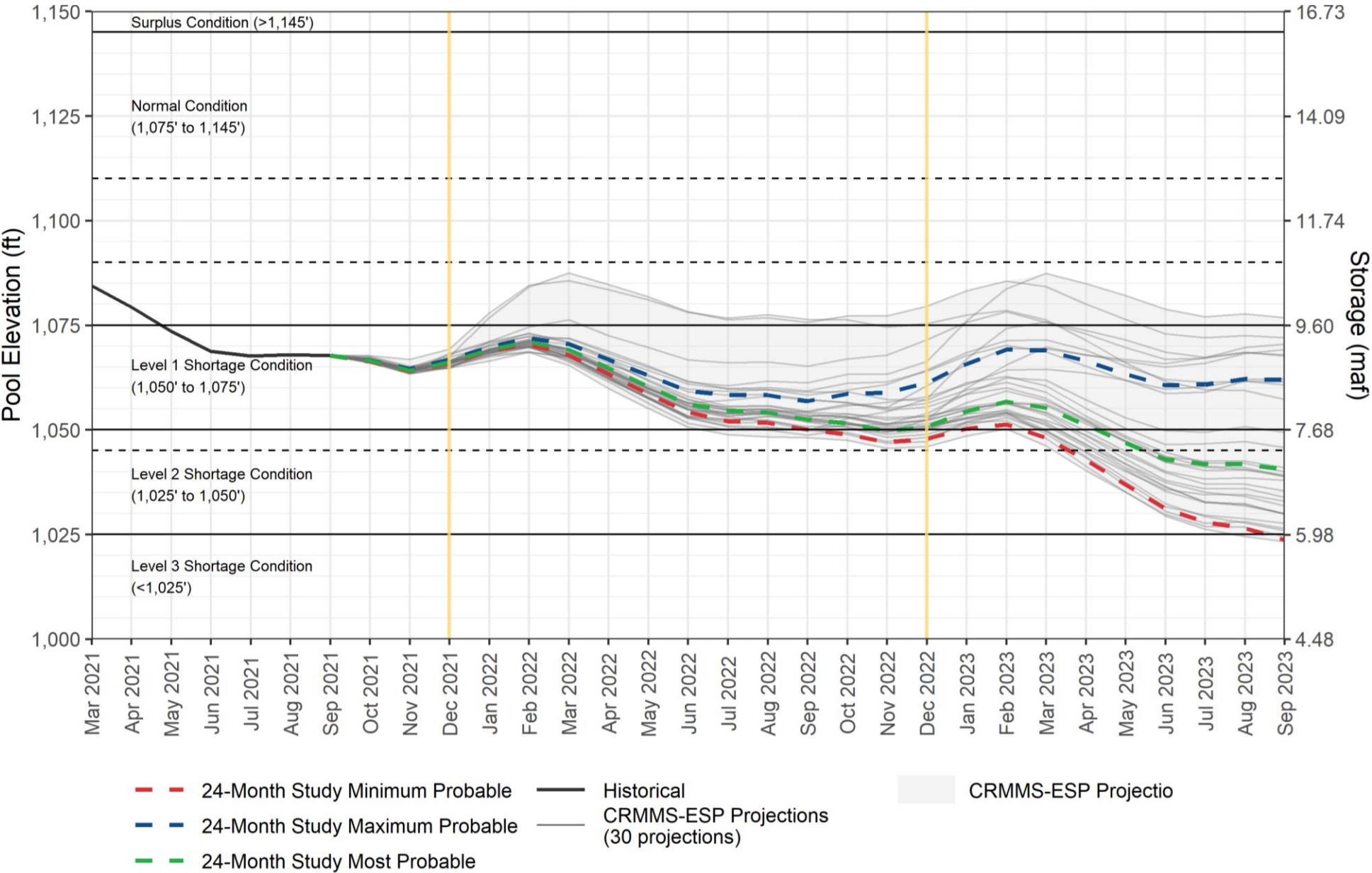
Lake Powell End-of-Month Elevations

Projections from the October 2021 Colorado River Mid-Term Modeling System (CRMMS)



Lake Mead End-of-Month Elevations

Projections from the October 2021 Colorado River Mid-Term Modeling System (CRMMS)



Comparison of Corrected August 2021 Without UB DRO and June 2021 Projections with UB DRO

Chance of Reaching Critical Reservoir Elevations, Stress Test Hydrology

	Run	2022	2023	2024	2025	2026
Lake Mead less than 1,025 feet	June 2021	0%	17%	44%	58%	63%
	August 2021 Corrected	0%	25%	44%	59%	63%
	Difference	0%	+8%	0%	+1%	0%
Lake Mead less than 1,000 feet	June 2021	0%	0%	9%	21%	23%
	August 2021 Corrected	0%	0%	13%	19%	22%
	Difference	0%	0%	+4%	-2%	1%
Lake Powell less than 3,525 feet	June 2021	79%	30%	25%	30%	34%
	August 2021 Corrected	88%	53%	41%	44%	41%
	Difference	+9%	+23%	+16%	+6%	+7%
Lake Powell less than 3,490 feet	June 2021	0%	5%	17%	16%	22%
	August 2021 Corrected	3%	34%	25%	28%	34%
	Difference	+3%	+29%	+8%	+12%	+12%



For more information:
<https://www.usbr.gov/uc/water/>
<https://www.usbr.gov/lc/riverops.html>



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